

# Alternative Technologies

## Frequently Asked Questions

### THE NEED:

**1. *Why is the Bureau of Sanitation (BOS) looking into alternative waste disposal technologies (alternative technologies)?***

Available landfill space is limited. The BOS goal is to divert and reduce the amount of solid waste being sent to landfills in a socially responsible manner. The BOS is seeking cleaner, environmentally friendly, and more economical alternatives to landfill disposal of solid waste in order to reduce criteria air pollutants and greenhouse gases, while recovering and reusing our precious resources, generating renewable energy, green fuel and lessening our dependence on fossil fuels. The City is evaluating alternative technologies to process only “black bin” trash, or post-recycled residue, which is now sent to landfills

**2. *Why is managing Municipal Solid Waste (MSW) locally socially responsible?***

More environmentally viable methods for solid waste management are now becoming available. These alternatives can provide greater resource recovery, generate renewable energy, green fuel, and lessen our dependence on imported oil. Alternative technologies create local green environmental jobs, and have net reduction in the generation of criteria air pollutants and greenhouse gases from the impact of transportation (vehicle emissions, traffic and noise) of the waste to the landfill and minimizing landfill impacts.

**3. *What are the goals of the alternative technologies efforts?***

The goals of solid waste management include seeking environmentally, socially, and economically sustainable solutions. We must find ways to decrease the amount of waste we send to landfills. Alternative technologies will also help decrease harmful emissions (criteria air pollutants, greenhouse gases, etc.) and help to create renewable energy and to lessen our dependence on fossil fuels.

**4. *What is the urgency behind the implementation of alternative technologies?***

Urban landfill space is limited. We are paying higher costs to landfill the waste we are currently generating and will continue to pay for many years to- maintain City-owned landfills, even after they are closed for approximately 30 – 40 years. We must consider methods to reduce the amount of waste going to landfills and utilize the majority of the waste we now throw away as a resource to generate renewable energy. Alternative technologies also reduce the emissions of criteria air pollutants and greenhouse gases and lessen our dependence on fossil fuels.

### TECHNOLOGIES:

**5. *What kinds of alternative technologies are currently in commercial use and where?***

In recent years, new clean methods for processing municipal sold waste have made their way into commercial use, most of which are found in Europe and Asia. There are many types of alternative technologies, but the major categories are: biological conversion most useful with plant or animal waste (i.e., decomposition of materials into bioenergy and other solid resources), thermal (i.e., producing heat, synthetic gases “syngas”, fuels and/or chemicals generated during thermal treatment of solid waste), and physical (i.e., densification, pelletization and refuse derived fuel).

**6. *How are these alternatives being considered for the City of Los Angeles?***

BOS is considering technologies that will increase landfill diversion in an environmentally-sound manner, while emphasizing options that are energy-efficient, socially acceptable, and economical. BOS will be evaluating proven technologies for its full-scale facility (between 200 – 1000 short-tons/day) and any emerging technologies for its pilot scale facility (up to 200 short-tons/day)

**7. *What are the basic differences between biological, thermal, and physical alternative technologies?***

Biological alternative technologies utilize microbial processes to decompose complex organic materials to smaller, more manageable components. These processes include decomposition with or without oxygen, augmented by various size-reduction, elevated temperature (400° F or less), e.g. anaerobic digestion, and moisture-control. In general, biological technology is excellent when the feedstock is predominantly organic material, derived from either plant or animal wastes. The byproducts of biological process are mostly "biogas that can be used as renewable energy and a significant volume of compost. If the compost doesn't meet certain standards, it will need to be landfilled.

Thermal alternative technologies apply heat to process the waste. Thermal energy can treat both organic and carbon-based (plastics) materials. The primary products of thermal alternative technologies are synthetic gas (syngas), liquid fuel or heat (steam) which can be used to generate electricity and green fuel.

Significant improvements in emissions control and reuse of solid residues have been developed over the past two decades. Thermal technologies optimize landfill diversion and can also deliver substantial beneficial return in the form of thermal energy for electricity generation and industrial process heat.

Physical alternative technologies involve altering the physical characteristics of the waste. Mechanical separation, shredding and/or drying; other physical methods can be used. The resulting material is referred to as refused-derived fuel (RDF). It maybe densified or pelletized, transported, and combusted as supplementary fuel in utility boilers.

**8. *How do alternative technologies lead to energy savings?***

In the current waste disposal practice, energy usage involves the entire life-cycle of collection, long-distance transport, landfilling, continuing operations and maintenance, and post-closure pollution monitoring. As we replace older disposal methods with environmentally "cleaner" newer alternatives, significant energy savings will result, primarily because trash currently landfilled will be used to produce renewable energy. This energy will offset energy produced with fossil fuels by utilities.

**9. *What is the difference between alternative technologies and landfilling?***

Alternative technologies will divert significant quantities of trash that is now landfilled. This diverted waste can be used to produce green renewable energy. In addition, the materials recovered (primarily metals and glass) by the facility will offset the extraction of virgin resources.

## **ENVIRONMENTAL FACTORS:**

**10. *What are the environmental benefits of alternative technologies compared to landfilling?***

The residues and gases from solid waste decomposition that occurs in our landfills are, at best, very difficult to recover as beneficial commodities, and at worst, create a concentrated source for long-term cost to society due to environmental pollution. The following are environmental impacts from landfills that will be reduced or eliminated by alternative technologies:

- Air emissions (criteria air pollutants and greenhouse gases)
- Surface and groundwater impact
- Soil and land impacts
- Generation of renewable energy
- Reduction of dependence on fossil fuel or imported oil.

**11. How do alternative technologies fit in with the City's Green Energy and other environmental initiatives?**

Useful commodities can be produced through alternative solid waste processing technologies: recovery of more recyclable items, and renewable energy. Recyclables will continue to be removed from the waste stream through the residential curbside blue bin program. The remaining portion of the residential black bin waste will be diverted as feedstock to alternative technology facilities, reducing the waste that ultimately goes to landfills. Moreover, any additional recyclables found in this wastestream will be pre-sorted and sent to a material recovery facility (MRF). This will assist in achieving the Mayoral Directive of 70% recycling goal within the City by 2015. The City has a Renewable Portfolio Standard (RPS) goal of 20% renewable energy by 2010. Additionally, the Mayor and Council, through its Council adopted RENEW LA plan, (recognizing the overall advantages of Alternative Technologies over landfilling) have set a goal of having an Alternative Technology facility operational by 2010.

Carbon emissions, more commonly referred to as "greenhouse gases," are harmful to the environment. Carbon emissions result from the combustion of fossil fuels and the biodegradation of organic materials (e.g. methane gas from landfills). The use of alternative technologies will reduce carbon emissions. Furthermore, since the small amounts of solid residues produced by these technologies are mostly inert (i.e. inorganic), landfill disposal of these residues will not contribute to increased carbon emissions, or any other impacts.

**ECONOMIC FACTORS:**

**12. Are alternative technologies economically feasible and how do they compare with landfilling?**

In the past, we understood very little of the actual cost of disposing waste "resources" into a landfill. Modern methods and decades of experience now show us **social costs**, in health impacts, reduced efficiency and job loss; **economic costs** in dollars spent to collect and transport wastes, create and maintain landfills, and pay for new things when recovered goods and materials could be obtained; and **environmental costs**, from landfill leaks that eventually pollute groundwater and soil and air emissions that damage our air quality.

The City of Los Angeles is rapidly running out of landfill space. The only recourse is to rail the waste to distant landfills, which will bring much higher disposal costs as well as greater environmental impacts.

Managing our wastes locally can be accomplished at reasonable economic costs, and lower social and environmental costs.

**13. What are the economic benefits of alternative technologies?**

- Greater local employment;
- Reduced "life-cycle" costs compared with landfilling, and transport of wastes to remote facilities;
- Greater recovery of beneficial energy, green fuels, recyclables, residuals, and chemicals, than landfilling
- Reduced pollution-related costs, resulting from the reduction of air emissions and improved ground-water quality;
- Greater freedom from petroleum-sourced product dependency, by creating renewable fuels, energy and chemicals.

**SCHEDULE:**

**14. Is there a target date or deadline for implementing this project?**

The Mayor and Council have set a goal of establishing the first "commercial-scale" facility by 2010.

## GOING FORWARD:

### **15. *What is the process used to selected the technology?***

The Bureau of Sanitation with the assistance of a consultant evaluated over two hundred and fifty technology vendors. The list was narrowed to about twenty-five technology vendors a detailed Request for Proposal (RFP) has been issued. Responses received will be evaluated by a diverse technical panel made up of City staff and academia. The team will present its findings to the Mayor and the Los Angeles City council.

### **16. *How does the alternative technologies project fit in with other City of Los Angeles projects such as Recovering Energy, Natural Resources, and Economic Benefits from Waste for LA (RENEW LA) and Solid Waste Integrated Resource Plan (SWIRP)?***

With the projected increase in waste through population growth, the environmental, social and economical impact of current practices, and the decrease of urban landfills, we need to explore other options of advanced solid waste management that we can implement. Common sense dictates a moderate and cautious approach, but one that offers as great a diversity of options as possible. SWIRP, the twenty-year master plan for solid resources management within the City through stakeholder input and participation will illustrate the needs and gaps within existing infrastructure and programs, and will develop a toolbox of options under consideration; the RENEW LA program puts a policy voice to the political will driving this process toward solutions. Alternative technology facilities are a vital component in each of these Plans.

### **17. *How will the site for the first facility be selected?***

A facility will be sited based on public acceptance, ensuring environment, social and economic criteria are met, and environmental justice issues are addressed. Thereafter, many factors must then enter into consideration of site selection: proximity to the waste sources, health and safety of the surrounding communities, suitable zoning, accessibility, proper existing municipal planning and infrastructure, and the consensus of our combined local community, City, state and federal leadership to provide sound selected process.

### **18. *How will the community be involved?***

The BOS has begun its outreach to educate residents by providing insight into the complex issues surrounding changes to our current practice of solid waste management. A clear understanding of current challenges and possible solutions is necessary for significant change to be accepted by the public.

The second outreach step will seek public input and involvement by identifying those that are prepared to really become engaged in this process of change, and engaging them as information conduits and spokespersons within their own constituency.

The third outreach step will involve significant community involvement relating to selecting a suitable site for the first alternative technology facility and proceeding through the required environmental and permitting process. The public will review and comment on a comprehensive Environmental Impact report prepared in accordance with the California Environmental Quality Act (CEQA).

## GLOSSARY OF TERMS

Alternative municipal solid waste (MSW) processing technologies

- *Alternatives to current MSW management; usually, alternatives to disposal in sanitary landfills.*

Biological processing technologies

- *Utilizing microbial decomposition to reduce wastes and byproducts to their components.*

Composting

- *Biological aerobic breakdown (with oxygen) of organic materials into their components, whether the process is naturally occurring or man-made.*

Due diligence

- *Objective assessment of all aspects of a technology, processing method, company or siting.*

Emission Control System

- *Methods and technologies for containment and control of releases to the environment (primarily referring to air pollutant emissions).*

Feedstock

- *Waste, byproducts or purpose grown materials intended for processing toward recovery of energy, fuels, and/or chemical products.*

Incremental mitigation

- *Gradual and methodical cleaning and repair; for enhanced environmental quality, refers to replacement of older, dirtier methods and technologies with newer, cleaner means.*

Landfill diversion

- *Alternative waste management practices that result in a reduction in the amount of refuse sent for final disposal to a sanitary landfill.*

Life-cycle assessment

- *Consideration and quantification of ALL aspects of a situation, from inception to final cessation. For waste management and technologic process assessment, refers to understanding the socio-economic and environmental implications, from initial release of a material into the waste stream, through transport and handling, recovery and/or disposal.*

Life-cycle cost

- *Consideration and quantification of all costs associated with a situation; for waste management, this usually refers to actual hard costs in dollars, leaving social and environmental costs to the broader discussion.*

Municipal solid waste (MSW)

- *Solid waste materials generated within a municipality; mixed types of waste materials, after release by the generator to the common waste stream, but prior to any concerted attempt to recycle or recover goods, products or beneficial uses.*

Post-recycled residue

- *Following recycling, the mixed-type solid waste residue left that is usually then transported to and disposed of in a sanitary landfill.*

#### Rail-haul

- *For waste management, to load and transport locally-generated wastes to more distant processing and/or disposal facilities via the railroad.*

#### Recovering Energy, Natural Resources, & Economic Benefits from Waste for LA (RENEW LA)

- *25-year waste management, recycling and resource recovery program initiated in 2005 by Councilman Greig Smith, District 12, for the City of Los Angeles (see [www.lacity.org/council/CD12](http://www.lacity.org/council/CD12))*

#### Recycling

- *To return materials and goods back to beneficial usage; for waste management practices, the process of separation and recovery of useful goods and materials from the common waste stream, and the process of source-segregation, where waste generators themselves separate useful goods and materials.*

#### RDF

- *Refuse derived fuel is a fuel produced by shredding and pelletizing MSW using steam pressure in an autoclave. RDF consists largely of organic components of municipal waste.*

#### Renewable energy

- *Energy (both thermal and electric) derived from renewable, sustainable sources, such as solar, wind, biomass, waste, and moving water.*

#### Solid Waste Integrated Resource Plan (SWIRP)

- *Master Plan under development by BOS to coordinate all aspects of municipal solid waste management, including materials recovery and recycling, rail-haul, alternative technologies, and landfill disposal through a stakeholder driven process.*

#### Source reduction

- *To implement a reduction program at the point source of waste generation (i.e. at the front-end of manufacturing, packaging, creating a product, etc) prior to its use and final disposal.*

#### Sunshine Canyon

- *Sanitary Landfill privately owned and operated by BFI, serving the City of Los Angeles and surrounding region, receiving and burying over 3.775.200 tons of waste per year.*

#### Syngas

- *Synthetic gas produced from the breakdown of organic and/or carbon-based feedstock, in a thermal conversion processing system; renewable, combustible fuel gas, syngas is also a non-petroleum refining commodity for production of other chemicals or liquid fuels.*

#### Thermal processing technologies

- *Any controlled application of thermal energy (heat) to process wastes, by-products or purpose-grown crop, for the production of energy (thermal and electrical), fuels and/or products.*

#### Tipping fee

- *A charge levied against the delivery of wastes to a waste management facility; cost of "tipping" wastes onto a solid waste management facility receiving-floor or containment area.*

#### Waste to Energy

- *Conversion of refuse, the materials thrown away and intended for final disposal, into energy, both thermal and electrical. Usually refers to thermal processing of waste to recover heat for steam production and electrical generation.*